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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-----------------------|---------------------|------------------|
| 10/701,509 | 11/06/2003 | Leland Graeme McInnes | | 7380 |

37942 7590 01/26/2007
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| EXAMINER |
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KRASNIC, BERNARD

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| ART UNIT | PAPER NUMBER |
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2609

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 01/26/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|-------------------------------|--|--|
| Office Action Summary | Application No. 10/701,509 | Applicant(s) MCINNIS, LELAND GRAEME | |
| | Examiner Bernard Krasnic | Art Unit 2621 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date: ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date: ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "300" has been used to designate both a modem as shown in Figure 3 and an algorithm as shown in Figure 4. Also, reference character "310" has been used to designate both a system bus as shown in Figure 3 and an initial approximation of the transformation grid T_c as shown in Figures 4. This change should also be made to the specification where necessary.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Reference sign "144" of a server in page 6, line 10 of the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of

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any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because the phrase "The invention provides" in line 1 and "The invention also provides a related image distortion system" in line 14 is suggested deleted. It is suggested in line 1 to be -- A method and system of distorting an image --. Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities:

Page 11, lines 11, 22, 23, and 26 respectively: "Ms" should be -- Mc -- as mentioned in reference sign "320" of Figure 4. "Ms" represents an "approximate magnification value" as mentioned in page 12, line 1 of the specification, not an "implicit magnification".

Appropriate correction is required.

Claim Objections

6. Claims 1-3 are objected to because of the following informalities:

Claims 1 and 3, lines 6 and 8 respectively: "an intended magnification value (Ms)" in line 6 and "an estimated magnification value (Mc)" in line 8 should be -- an intended magnification value (Mc) -- in line 6 and -- an estimated magnification value (Ms) -- in line 8 because in page 12, line 1 of the specification and in reference signs "320" and "330" of Figure 4, it states that the "(Ms)" is the "estimated magnification value" and "(Mc)" is the "intended magnification value".

Claim 1, lines 12-13, and claim 3, lines 9-10 respectively: "between the intended magnification value(s) and the estimated magnification value(s)" should be -- between the estimated magnification value(s) and the intended magnification value(s) -- because in page 11, line 12 of the specification, it is stated that "ME is calculated as $Ms - Mc$ ".

Claim 1, line 5: "one or more of the data values" should be -- one or more of the base data values --.

Claim 1, lines 6-7, and lines 8-9 respectively: "retrieved data values" should be -- retrieved base data values --.

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Claim 1, line 12: "calculating the difference" should be -- calculating a difference --.

Claim 1, line 14: "until ME is less than" should be -- until the difference ME is less than --.

Claim 2, line 1: "An image distortion" should be -- The image distortion --.

Claim 2, line 6, and line 8 respectively: "calculating the maximal" should be -- calculating a maximal --.

Claim 2, line 9: "calculating the difference" should be -- calculating a difference --.

Claim 2, line 11: "adjusting the value of p" should be -- adjusting the value of the parameter p --.

Claim 3, line 6, and line 8 respectively: "the data values" should be -- the base data values --.

Claim 3, lines 9-10: "compare the difference between the intended magnification value and the estimated magnification value (ME) with a threshold value" should be -- compare the difference (ME), between the intended magnification value and the estimated magnification value, with a threshold value --.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keahey ("Nonlinear Magnification" - Indiana University - Ph.D. Dissertation - August 1998 - 176 pages).

Re Claims 1 and 3 as understood: An image distortion method / magnification method comprising the steps of (a) maintaining in computer memory a set of base data values / i,j coordinate values of un-transformed or un-magnified original image representing an image to be subjected to a transformation function / T_c ; (b) calculating an approximation of the transformation function / iterative method for converging T_c ; (c) retrieving from computer memory one or more of the data values; (d) calculating an intended magnification value (M_c) / M_c (see page 74, line 5, implicit or intended magnification M_c) for one or more of the retrieved data values; (e) calculating an estimated magnification value (M_s) / M_s (see page 74, lines 2-3, specified or estimated magnification M_s) for one or more of the retrieved data values; (f) storing in computer memory the estimated magnification values as a set of transformed data values representing the transformed image; (g) calculating the difference (ME) / ME (see page 74, line 6, $ME = M_s - M_c$) between the estimated magnification value(s) and the intended magnification value(s); and (h) repeating steps (c) to (g) until ME is less (see page 80, using RMSE which consists of ME as a variable, a convergence may be measured and convergence deals with a this variable being less than a specific

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threshold) than a predefined threshold / convergence (see pages 74-75, basic pseudo-code representation of the basic algorithm).

Although the maintaining, the calculating, and the storing onto computer memory steps of Keahey's magnification-based magnification algorithm is not specifically disclosed, it would be obvious to one of ordinary skill in the art at the time the invention was made to have such features because this pseudo-code representation could be implemented onto a computer and a computer definitely would have in its memory the original unmagnified base data values, would definitely have the capability to retrieve from the memory the base data values such as any processor does, would definitely have the calculating means for determining M_c and M_s , would definitely have the capability to store the calculated variables into a memory such as RAM or cache for further calculating needs of ME since $ME = M_s - M_c$, would definitely have the calculating means to determine the difference between the variables M_s and M_c , and would definitely have the capability to iterate this process until a convergence is met.

As to claim 3, it differs from claim 1 in that claim 1 is a method claim whereas claim 3 is a system claim. Therefore, all the limitations in claim 3 respectively are analyzed and taught by Keahey in the same manner Keahey taught claim 1 above; the component, the calculators, and the measurer of claim 3 are considered to be parts of Keahey's pseudo-code operating in the processor, and RAM or cache of a CPU.

Re Claim 2: An image distortion method / magnification method as claimed in claim 1 wherein the step of calculating an approximation of the transformation function / iterative

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method for converging T_c further comprises the steps of (a) defining an approximating function / using RMSE to approximate T_c to approximate the transformation function, the approximating function / RSME including one or more parameters / ray defined by $p = T_c(i,j)$, ray defined by its neighbor $q = T_c(i+1,j)$, and ME (see page 76); (b) defining an initial value of one of the parameters (p) / $p = T_c(i,j)$ (see page 76); (c) calculating the maximal value of the derivative / largest magnification value or largest M_s (the largest magnification value is considered by the examiner to be the largest value of the derivative of the transformation function as mentioned in the applicants specification in page 13, lines 22-24) of the approximating function using the parameter p ; (d) calculating the maximal intended magnification value / largest M_c using the parameter p ; (e) calculating the difference / $ME = M_s - M_c$ between the maximal value of the derivative and the maximal value of the intended magnification value; (f) adjusting the value of p (when T_c is adjusted during iteration, then p is also adjusted since $p = T_c(i,j)$); and (g) repeating steps (c) to (f) until the difference / $ME = M_s - M_c$ between the maximal value of the derivative and the maximal value of the intended magnification value is less than a pre-defined threshold / convergence (see page 75, pseudo-code, page 80, using the RMSE, a convergence of T_c is decided).

Although calculating the maximal steps of Keahey's magnification-based magnification algorithm is not specifically disclosed, it would be obvious to one of ordinary skill in the art at the time the invention was made to have such a feature because a maximal value always occurs at the same specific point and this point definitely is calculated in addition to other values when Keahey's RMSE

$\left(RMSE = \sqrt{\frac{1}{p \times q} \sum_{i=1}^p \sum_{j=1}^q M_E(i, j)^2} \right)$ is calculated. As the calculation of RMSE goes

through all the values of i and j, the maximal point which occurs at a specific point will definitely be met.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Huang et al discloses a method and apparatus for converting a photo to a caricature image; Poggio et al discloses a correspondence between n-dimensional surface: vector fields that are defined by surfaces and that generate surfaces which preserve characteristics of the defining surfaces; McInnes et al discloses an image distortion system and method; Segman et al discloses a non-linear and linear method of scale-up or scale-down image resolution conversion; Ramage discloses a method and apparatus for generating a variably scaled display.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Krasnic whose telephone number is (571) 270-1357. The examiner can normally be reached on Mon-Thur 8:00am-3:00pm and every other Friday 8:00am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on (571) 272-7044. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bernard Krasnic
January 8, 2007



JONG SUK LEE
SUPERVISORY PATENT EXAMINER